

On actual working

Actual work is always slow, stepwise

- you create a model on theoretical basis
 - run data through this model
- compare the fit between your expectations (i.e. your hypothesis) and data
 - redo the process until fit is good

The remaining tasks are:

- checking possible errors
 - // this is sometimes technical work (studying issues like multicollinearity, outliers, kurtosis, skewedness in distributions, etc.)
 - // sometimes this is a conceptual phase, just thinking through possible errors in, say, conferences
- interpreting the model theoretically
- argumentation: why your model is better than existing models in literature

Finally

You've seen a pattern, I hope:
analysis is an attempt to find an
invariance or pattern from data,
and attributing it to a cause.

It is not about being exact in
math sense, but being able to
make sensible assumptions
about what not to pay
attention to.

Reading and thinking are important, not any particular technique. They help to identify threats to valid inferences.

In survey analysis and qualitative analysis, you describe invariance and then reason about what led to it.

In experimental analysis, you try to replicate the process in lab-like situations, or “In the Wild”

However, the point is always searching for invariance, and trying to make sense of it as soon as you find it

Most of the most influential studies in the world are done with fairly simple technical means.

The point in research is discovery, not technical wizardry.

Lecture 8

Complications

I.
Ceteris paribus
Other things being equal

Necessary

We always make assumptions to create models that work
This term makes this open

Economic

Ceteris paribus helps to create complex models

However,

a justified assumption adds inaccuracy, but does not introduce systematic error

It is crucial that we can assume that there is **NO SYSTEMATIC BIAS** in any variable we assume away

Dangers

With lots of Cet.Par assumptions, theory gets elegant, but risky: think about economics. Sophistication is bought by accepting a lot, and long chains of creeping generalizations

Protects status quo.

Laziness

Justification

...is typically instrumentalist: accepting ceteris paribus helps to build sophisticated theory

...that one day is proven right.

Does this work in design research?

2.

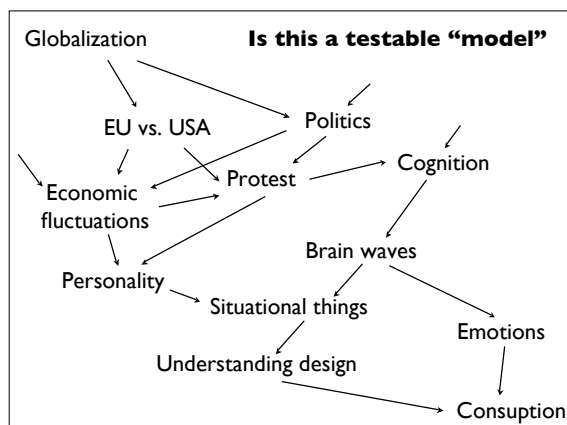
Make error a friend

What is a “complete” explanation?

Does a model have to explain 100% of variation or is, say, 40% enough?

Specification

Trying to specify everything leads to astonishing complexity.



Parsimony

Occam's Razor

Think about error term as a friend

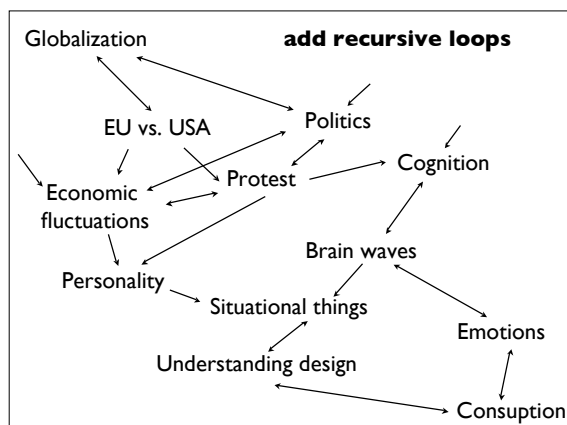
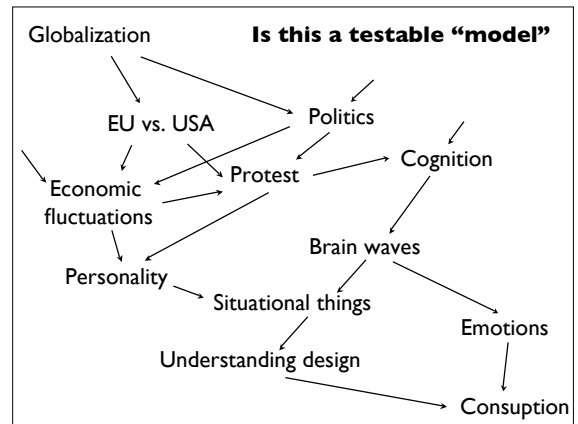
1. Build the model the best you can
2. Elaborate and elaborate more
3. When the explanation does not change, go with it, even though it explains only 40% of variance even though it has only 3-4 elements
4. ... provided that the rest (60%) consists of *small* improvements

Again,

this logic works in qualitative research too...

but it is a matter of philosophy

3a. Recursivity



Recursivity

adds accuracy, but also a lot of complexity to your system
...making research very difficult.

3b. Reversibility

Does...

...change in X, Q, Z lead to change in X

AND

when the causal effect is not operating,
does X return to its previous state?

Many physical systems are reversible
 ...but few biological and social are: they
 tend to be irreversible

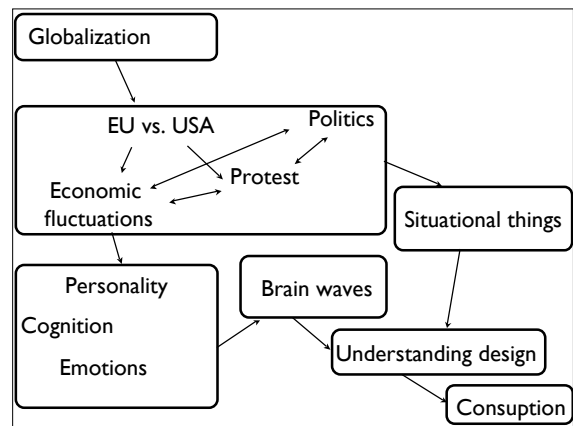
Working with recursivity and (ir)reversibility

Specify unit of analysis:
 intrapersonal, personal, group,
 community, society, regional, global

Working with recursivity and (ir)reversibility

Specify the model in terms of "ecological"
 or "contextual" variables:

- separate these various layers, since they
 tend to work autonomously



The main benefit Clarity: here
 variables are not a big mess, but have an
 order

Research gets a structure: both data
 gathering and analysis proceeds in certain
 order

...or in practical terms

You treat the key level first as X and Y
 an elaborate it

And then add more contextual/ecological
 level variables...

until the explanation does not improve

The main difficulty:

After the 1980s, reflexive arguments have gained ground, questioning this logic and making inference mushy

Even if you are reflexivist, structuring your inference helps tremendously in creating better arguments